

**What Is Claimed Is:**

- 1        1. A method for constructing a superconducting cable comprising N phases, the method comprising the steps of
  - 2              - providing each phase in the cable in the form of a number of phase conductors,
  - 3              - classifying the phase-conductors in N-phase groups, each N-phase group comprising a phase conductor from each of N different phases, where N is greater than one,
  - 4              - arranging insulation means in the cable around each phase conductor or between assemblies of phase conductors,
  - 5              - providing the N-phase groups or assemblies of N-phase groups with a common electrically conductive screen.
- 6        2. A method according to claim 1, wherein the individual phases only contain superconducting cable wire and an insulation system.
- 7        3. A method according to claim 1 or 2, wherein the N-phase groups are arranged in a number of coaxial groups, either with several different phase conductors corresponding to different phases in each coaxial layer or with each individual phase conductor of a particular phase in a separate coaxial layer.
- 8        4. A method according to claim 1 or 2, wherein the N-phase groups or each of the assemblies of N-phase groups are arranged so that the phase conductors form N flat phases.

1       5. A method according to claim 1 or 2, wherein each of  
2       the phases is constructed by one or several individual  
3       conductors such as tapes.

1       6. A method according to claim 1, wherein all N-phase  
2       groups are gathered in one assembly which is surrounded  
3       by one common electrical screen.

1       7. A method according to claim 6, wherein the N phases  
2       are arranged concentrically with concentric insulation  
3       between each of the N phases.

1       8. A method according to claim 1, wherein the phases in  
2       each N-phase group or assembly of N-phase groups are  
3       separately and electrically isolated from each other.

1       9. A method according to claim 1, wherein the phases in  
2       each N-phase group or assembly of N-phase groups are  
3       isolated from each other by a common insulator.

1       10. A method according to claim 1, wherein the number of  
2       N-phase groups is larger than 10.

1       11. A method according to claim 1, wherein the  
2       electrical screen is kept at 0 potential and consists  
3       fully or partially of superconducting, metallic, and  
4       semiconducting materials or of a combination of these  
5       materials with non-conducting materials and composites  
6       and is positioned close to the electrically insulating  
7       material.

1       **12.** A method according to claim 1, wherein the  
2       individual phases in each N-phase group or assembly of N-  
3       phase groups have such permittivity that they co-operate  
4       magnetically.

1       **13.** A method according to claim 1, wherein at least one  
2       of the phases is constituted by a neutral conductor.

1       **14.** A superconducting cable consisting of N phases,  
2       wherein each phase in the cable comprises a number of  
3       phase conductors, the phase-conductors having been  
4       classified into N-phase groups, each N-phase group  
5       comprising a phase conductor from each of the N different  
6       phases, where N is greater than one, and wherein  
7       insulation means have been arranged in the cable around  
8       each phase conductor or between assemblies of phase  
9       conductors, and the N-phase groups or assemblies of N-  
10      phase groups has/have been provided with a common  
11      electrical screen.

1       **15.** A method according to claim 1, wherein the number of  
2       N-phase groups is larger than 100.